The Effect of Music Therapy for Elderly with Dementia: A Systematic Review Music Therapy for Elderly with Dementia

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Abstract: Background: Dementia is a term used to describe a condition which results in progressive organic brain disease affecting memory deficit, generally in adults aged 60 years or more. Music therapy is non-pharmacological interventions reducing symptoms of dementia. Methods: Databases searched included SCOPUS, SAGE, Web of Science, Oxford Academic Journal, and Science Direct. Inclusion criteria were 5 years limit journals (2013-2017), article type documents, English, gerontology nursing area, and participants ≥60 years with dementia. Exclusion criteria were a literature review, editorial, critical synthesis, discussion paper, comment, meta-analysis, mini-review, study protocol and second disease in participants such as hypertension, diabetes mellitus, stroke. Results: Interventions of active music therapy, passive music therapy, and combination music therapy demonstrate greater improvement of parasympathetic nerves and reduce sympathetic nerves activity. The output increase self-esteem, cognitive status, coping and emotional, and decrease depression, agitation, wandering, mood, anxiety, phobia, paranoid, and delusional. Conclusions: The finding of this review highlight music therapy potentially reduce symptoms of dementia in elderly.

1 BACKGROUND

Dementia is a term used to describe a condition which result in progressive organic brain disease affecting short-term memory and cognitive deficit (Holmes and Amin, 2016). Dementia affecting neuropsychiatry disorders, such as the process of thinking, affection, perception, behavior, mood changed, and depression (Knopman, 2001 in Ahn and Ashida, 2012). The symptoms of dementia are cognitive disorder such as losing short-term memory, aphasia, apraxia, and agnosia (Holmes and Amin, 2016).

Southeast Asia has placed in 4th ranks of most cases dementia after East Asia, Asia Pacific, and South Asia (Prince *et al.*, 2015). Indonesia, one of the Southeast Asian countries in particular has been estimated number of people with dementia increase from 960,000 in 2013 to 1,890,000 in 2030 and 3,980,000 in 2050 (World Report Alzheimer, 2012 dalam Kementrian Kesehatan RI, 2015).

Dementia raises a global disturbance of cognitive function with a normal level of consciousness (Holmes and Amin, 2016). Therapies used for symptoms of dementia include of pharmacological and non-pharmacological (Blackburn and Bradshaw, 2014 in Ray and Mittelman, 2015). Non-pharmacological therapy such a music therapy is the most effective long-term psychological approach in reducing symptoms of dementia (Sjogren, Lindkvist, Sandman, Zingmark, & Edvardsson, 2013 in Ray and Mittelman, 2015). Music therapy aims to overcome stress, cognitive strength and mind to people with dementia. Various studies related to the effectiveness of music therapy against symptoms of dementia has been applied in various countries. The purpose of this review is to highlight music therapy that potentially reduces symptoms in the elderly with dementia.

2 METHODS

Sources of this review used SCOPUS, SAGE, Web of Science, Oxford Academic Journal, and Science Direct. Inclusion criteria were 5 years publication (2013-2017), respondents with age ≥ 60 years both women and men with the various mild-severe level of dementia, either home nursing or hospitalization and willing to be given music therapy. Exclusion criteria were literature review, editorial, critical synthesis, paper discussions, comment, meta-analysis, mini-review, and study protocol. Respondents with additional diseases such as hypertension, diabetes mellitus, and stroke become the exclusion criteria either. Articles selection started on December 1st, 2017. The process of articles selection can be seen in Figure 1.

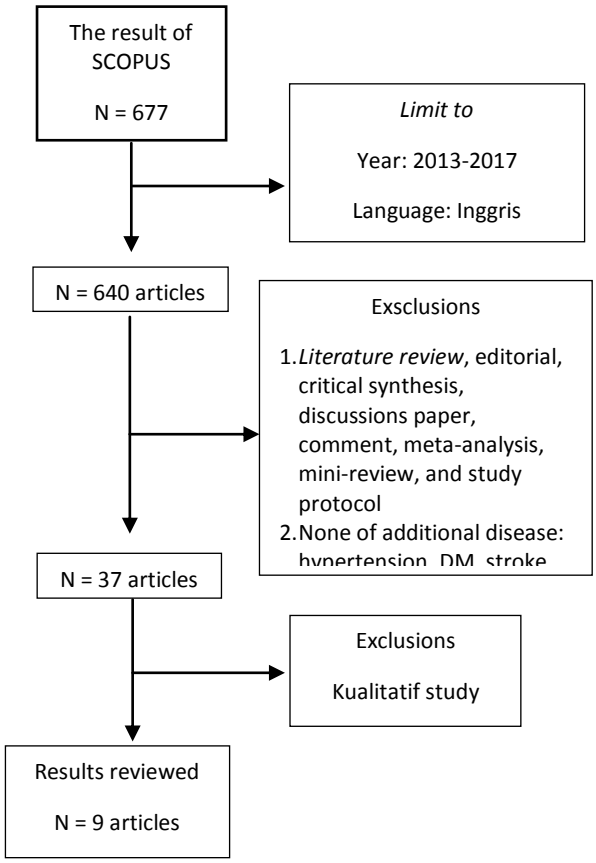

Figure 1. The process of paper selection

The search is limited on the scope of nursing, gerontology, aging, geriatric, dementia, dementia and *alzheimer* disease. The search is also limited to English "Article" document type.

The study excluded from 677 by year, area of study, type of document, and the language in order to obtain 37 articles. There are 37 articles will do inclusion and exclusion criteria in order to obtain the corresponding 9 journal articles. Those articles will examine as a systematic review using Picot.

3 RESULTS

The year of this research has started from 2014 to 2017. These reviews come from various countries; USA, Singapore, Taiwan, Japan, Germany, Italy, France, and Spain. Music therapy intervention in the systematic review can be seen in table 3.1 and 3.2.

Table 3.1 Frequency of music therapy

No.	Code	Σ Sample (n)	Onset (minute)	Giving old
1.	P1	132	15-60	3x / week for 2 weeks
2.	P2	12	90	3x / week for 3 months
3.	P3	100	30	2x / week for 6 weeks.
4.	P4	39	30	1 x / week for 10 weeks
5.	P5	117	40	2x / week for 6 weeks
6.	P6	16	45-60	12 weeks
7	P7	120	30	2x / week for 10 weeks
8	P8	64	120	2x / week for more than 1 month
9.	P9	20	30	2x / week for 16 weeks

Based on table 3.1, four of nine journals show the average onset used in music therapy is 30 minutes and five of nine journals provide music therapy intervention twice per week.

Table 3.2 Type of music

No.	Code	Σ Sample (n)	Genre	Instrument
1.	P1	132	Combination	1. Cornell Scale For Depression (CSD) 2. Wandering Algase Scale (AWS) 3. Cohen Mansfield Agitation Inventory (CMAI) 4. Reisberg's Functional Assessment Screening Test (FAST)
2.	P2	12	Combination	1. Menorah Park Engagement Scale (MPES) 2. Observed Emotion Rating Scale (OERS)
3.	P3	100	Combination	1. Chinese Version of the Cornell Scale for Depression in Dementia (CSDD) 2. Mini-Mental State Examination (MMSE)
4.	P4	39	Combination	Behavioral Pathology in Alzheimer's Disease (Behave-AD) Rating Scale
5.	P5	117	Combination	Montgomery Asberg Depression Rating Scale, MADRS)
6.	P6	16	Combination	Suspended for Quality of Life
7	P7	120	Passive	1. The Neuropsychiatric Inventory (NPI) 2. Cornell Scale for Depression in Dementia (CSDD), 3. Cornell-Brown Scale for Quality of Life in Dementia (CBS-QoL)
8	P8	64	Combination	State-Trait Anxiety Inventory for Adults (STAI-A)
9.	P9	20	Combination	Multisensory stimulation environment (MSSE)

Based on Table 3.2, there are 8 of 9 journals using a combination of music therapy. Research showed music therapy significantly decrease the levels of depression and agitation by CMAI, and decrease the rate of wandering by AWS (Ray and Mittelman, 2015). A pilot study used the control situation without music on the first day and used creative music therapy (CMT) in the second and third day. The music given in those study were improvisation music accordance to the client's desire. The result showed statistically significant higher occurrences toward engagement and mood changed measured by Menorah Park Engagement Scale (MPES) and Emotion Observed Rating Scale (OERS) (Cheong et al., 2016).

Singing intervention, listening to music, playing music, and improvisation of music over 12 weeks, significantly increase the quality of life the elderly with dementia (Sole et al., 2014). The other research of music therapy can improve emotional and behavioral functions either (Samson et al., 2015).

Research with different interventions both passive and active combination music therapy proven to decrease depression level and inhibit cognitive impairment. The first group is given a passive music and the second group is given an active music therapy. Short-term effects of both groups are equally able to improve the parasympathetic nerves, but the active group showed a better mood than the passive group. Long-term effects in the passive group may decrease anxiety and phobia, whereas in the active group may decrease anxiety, phobia, paranoia, delusional, and activity impairment. The study of this music therapy can be applied with the onset of administration at least once a week for ten weeks (Chu et al., 2014).

Study showed an exploratory post hoc analysis similar within group reduce depression during treatment (Raglio et al., 2015). The other research ordered that music therapy decreases depressive symptoms in elderly people in nursing homes more effective than recreational singing (Werner, Wosch and Gold, 2015). The other study suggested that music therapy can decrease an agitation, improve cognitive and repair an emotion (Sanchez et al., 2016). The identification of the study can be seen in table 3.3.

3.3 Table identification study

No.	*Author / year of publication / country*	*Study design*	*Population*	*Intervention*	*Comparison*	*Outcome*	*Time*
1.	Ray and Mittelman (2015) USA	*exploratory design*	132 elderly people with symptoms of agitation, depression, wandering	Music performed by two therapists who are already certified. Music heard: 1.Under the Boardwalk 2.Love Me or Leave Me 3.Cheek to Chee 4.Hava Nagilah 5.Quizas, quizas, quizas 6.Stars and Stripes forever 7.Alexander's Ragtime Band 8.Beyond the Sea 9.Thais: Meditation (Tempo used 2/4, 4/4) Songs are: 1. Side by Side 2. You Are My Sunshine 3. Hava Nagilah 4. Tumbalalaika 5. Quizas, quizas, quizas 6. Michael Row the Boat Ashore 7. God Bless America 8. Tzenah Tzenah 9. Red River Valley (Tempo used 2/4, 2/2, 3/3, 4/4) Tone: 1.Row, Row, Row 2.Your Boat 3.Michael Row the Boat Ashore 4.Three Blind Mice 5.Three Blind Mice 6.You are My Sunshine 7.Oh Susanna 8.Clementine 9.De Colores (tempo used 2/4, 3/4, 4/4). Participants are grouped into groups	The presence of symptom changes in participants before and after music therapy	↓ depression ↓ agitation ↓wandering	3x/week for 2 weeks (15-60 minutes)

				consists of 4-6 elderly. Participants may freely leave the room. The music is chosen according to the participant's preference in the group.			
2.	Cheong et al. (2016) Singapore	*Pilot study*	25 people in elderly with Delirium and/or Dementia aged 86.5 ± 5.7 years	Interventions are performed by a certified therapist for 90 minutes (30 minutes before, 30 minutes during, 30 minutes after music therapy). First day (control condition without music), second and third days with CMT. The music provided is improvised based on client desired.	There are the differences before and after CMT	- Statistically significant in engagement (mean = 6.26, Z = 3.383, p = 0.01). - Positive mood changed (mean = 0.68, Z = 3.188, p = 0.01).	3x/week for 3 weeks (90 minutes)
3.	Chu et al. (2014) taiwan	*Prospective, parallel-group design, with permuted-block randomization*	104 elderly people with dementia. Divided into 49 experimental group and 51 control group. 4 participants drop out (2 uninterested, 2 hospitalizations)	The experimental group received 12 sessions of music therapy. The control group only received treatment as usual. Sessions 1 and 2 - musical instrument activity using triangles, clappers, maracas, handbells, and tambourines Sessions 3 and 4 - singing therapeutic activity that allowed for broad participation Sessions 5 and 6 - music listening Session 7 and 8 - color bell sound, hand function, and attention rehabilitation in the which the music therapist encouraged participants to name a color out loud and then press the bell of that color Session 9 and 10 - activity and traditional music festival in the which the therapist played music related to traditional festivals and encouraged of participants to	There are the differences in experiment group and the control group	↓ Depression ↓ Cognitive impairment - None salivary cortisol differences	2x/week for 6 weeks. (30 minutes)

				accompany the music Briefly with an instrument to demonstrate Reviews their sense of celebration Session 11 and 12 - music creators in the which the therapist asked each participant to choose			
4.	Sakamoto, Ando and Tsutou (2017) Japan	*Study Comparison*	39 people in elderly with dementia. Divided into passive group, interactive group, and control group.	The therapist treats the passive group by giving a CD music sound, the interactive group by listening to music and singing, clapping, dancing, and the control groups by none of the music.	There are short-term and long-term differences between passive group, interactive group, and control group.	- Short-term effect. ↑ Mood Interactive group > passive group - Long-term effect. a. Passive group ↓ anxiety ↓ phobia b. Interactive group ↓ Anxiety ↓ Phobia ↓ Paraoid ↓ Delusional ↓ Activity impairement	1x/week for 10 weeks (30 minutes)
5.	Werner, Wosch and Gold (2015) Germany	*Cluster randomized control study*	117 people in elderly with dementia 62 groups of music therapy 55 groups of recreational singing	Interactive music therapy performed with 2 type, the first by Muthesius and the second Hamberger. Muthesius used a holistic, person-centered approach, focusing on individual biography and milieu-orientation. Hamberger used the same as Muthesius but there are also multisensory elements. Type of music given are receptive music therapy, instrumental improvisation, and dance.	There are differences in reducing depression	↓ Depression Music therapy > recreational singing	2x/week for 6 weeks (40 minutes)

6.	Solé *et al*. (2014) USA	*Pretest-postets design*	16 people in elderly with dementia	Intervensi dilakukan pada 3 kelompok. Kelompok 1 terdapat 9 orang dengan GDS 3-4. Kelompok 2 terdapat terdapat 5 orang dengan GDS 5. Kelompok 3 terdapat 2 orang dengan GDS 6-7. Kegiatannya berupa meyanyi, mendengarkan musik, memainkan musik instrumen, dan improvisasi musik. The interventions were divided into 3 groups. There are 9 people with 3-4 GDS in the first group, 5 people with GDS 5 in the second group, and 2 people with GDS 6-7 in the third group. Activities include singing, listening to music, playing instrument music, and improvising music.	There are the differences before and after the therapy	↑ Quality of Life ↓ Depression	12 weeks (45-60 minutes)
7.	Raglio *et al*. (2015) Italy	*Randomized Controlled Trial*	120 people inn elderly with dementia	Patients were grouped into groups of MT (Music Therapy), LtM group (Listening to Music) independently, and control group	There is no significant difference between groups	↓ Depression	2x/week for 10 weeks (30 minutes)
8.	Samson *et al*. (2015) France	*Randomized Controlled Trials*	First study : 16 people in elderly with dementia. Second study: 48 people in elderly with dementia	Study 1: participants are given music by the therapist, and they can act passively (only listen) or active (by clapping, singing, dancing) for 2 hours. Study 2: the same as study 2 only but only 1.5 hours.	There are effectivity differences between each group	↑ emotional function and behavior	2x/week for more than one month
9.	Sánchez *et al*. (2016) Spain	*Randomized Controlled Trials*	20 people in elderly with severe dementia	The MMSE group is held in Snoezelen room which contains materials such as color fiber optic cable, water bed, rotating mirror ball with a color light Projector, video, musical selection, aromatherapy with fragrance oil. Here the participants are stimulated in both visual, auditory,	There is difference before and after the therapy.	↑ Cognitive status, emotional ↓ Agitation	2x/week for 16 weeks (30 minutes)

	tactile, and olfactory. The music therapy group performed in a quiet room, and the music was chosen according to the client's preferences.	

4 DISCUSSIONS

An increasing number of systematic reviews about music therapy have been published in recent years. Eight of the nine journals of combination music therapy is more often intervened in recent years in various countries. Eight journals have combined between active and passive music therapy, the other has combined with other therapy. Based on the onset of music therapy, four of nine journals given the therapy within 30 minutes. Five of the nine journals provide twice per week music therapy intervention, either passive and or active music with various types of music. It shows significant results in repairing of thought processes in dementia symptoms. Non-pharmacological interventions, such as music therapy, may be the most effective psychological approach to the improvement of long-term neuropsychiatric symptoms. These interventions can provide a low-cost alternative for treatment to reduce behavioral disorders.

5 CONCLUSIONS

Music therapy has been implemented in several countries around the world. The finding of this review highlighted the music therapy potentially reduced symptoms of dementia in elderly, but in this review, there are still shortcomings. This review is expected to be followed up through meta-analysis research.

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